

Model Adaptation: Unsupervised Domain Adaptation Without Source Data

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Abstract

In this paper, we investigate a challenging unsupervised domain adaptation setting --- unsupervised model adaptation. We aim to explore how to rely only on unlabeled target data to improve performance of an existing source prediction model on the target domain, since labeled source data may not be available in some real-world scenarios due to data privacy issues. For this purpose, we propose a new framework, which is referred to as collaborative class conditional generative adversarial net to bypass the dependence on the source data.

Specifically, the prediction model is to be improved through generated target-style data, which provides more accurate guidance for the generator. As a result, the generator and the prediction model can collaborate with each other without source data. Furthermore, due to the lack of supervision from source data, we propose a weight constraint that encourages similarity to the source model. A clustering-based regularization is also introduced to produce more discriminative features in the target domain. Compared to conventional domain adaptation methods, our model achieves superior performance on multiple adaptation tasks with only unlabeled target data, which verifies its effectiveness in this challenging setting.